Knapp (H. F.)

LECTURE

DELIVERED BY

HENRY F. KNAPP, C.E.,

BEFORE

The Polytechnic Branch of the American Institute

(Cooper Institute),

APRIL 24TH 1879.

RIVER SURFACES.

Do Jetties raise the Bed as well as the Surface? Ergo, will every River in the Mississippi Valley finally overflow? Is a River Bar as vitally necessary as a River Bank? Natural Drainage of the Valley impeded by Channel Contractments, and its malarious conditions thereby intensified.

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ADDRESS.

Mr. Chairman,

It may be accepted as one of the anomalies of the age, that river and harbour engineering for the improvement of channels and avoidance of overflow is and has been universally planned with almost a total disregard of practical reasoning. About every country to-day is, to a greater or lesser extent, suffering the penalty of the errors of its hydraulic engineers by overflowing rivers, whether they be leveed or not. The frequent fatal consequences of these engineering errors are now forcing themselves on the observation of the people, and engineers are compelled to acknowledge that the treatment is wrong somewhere, but how, or in what particular, they have arrived at no conclusion beyond the fact that totally unexpected adverse results have developed themselves, and that these results, instead of growing less,

ARE CONTINUALLY GROWING GREATER.

The present season has been particularly disastrous throughout Europe, by overflowing rivers and inundated cities, especially in France, Spain, and Italy. Within a month past the river Theiss in Southern Hungary, a branch of the Danube, has burst its levees, and completely destroyed the town of Szegedin, containing 80,000 inhabitants, drowned a hundred people, and devastated an immense extent of country, which, it is said, will continue to be submerged for six months yet. Likewise the waters of the several confluents of the Theiss either overflowed or were only kept back by the almost super-

human efforts of the people. A dispatch says:—"Such a year of calamities caused by inundation is not within the memory of the oldest Hungarian."

Entire Europe to-day is tremendously reaping her crop of disasters, resulting from false engineering practice on her rivers and harbours, which have been most inauspiciously propagated by imitation. Shall we universally apply this imitation to our rivers and harbours, which are comparatively in their natural state as yet, and enter upon an expenditure of hundreds of millions of dollars to contract the capacities of our rivers and harbours, to be followed by resulting damages of thousands of millions of dollars by inundations and destruction of navigable channels? That is the important question before the country, and if the people would have it decided for the nation's good, they must see that politics have no hand in the decision; if they do, such hydraulic disasters cannot be harnessed to the future prosperity of the country.

THESE REPEATEDLY-RECURRING DISASTERS

have at last caused engineers to pause in the execution of similar works, and Governments are now making it a matter of serious study as to what is the proper solution of the subject. On the other hand, American engineers have just taken up the subject where it has been dropped abroad, and have adopted on very many important rivers the very errors that have caused such disastrous results abroad. My purpose to-night is to go over the entire question of improvements to rivers and harbours, and show, in a concise and logical explanation, the effects produced by the most prominent methods; and do not doubt that the simplicity of the subject, when freed from its past mystery, will enable even unscientific people to fully understand and agree with my views, as being the correct solution of these hitherto puzzling phenomena. I shall show that rivers under modern treatment have their

SURFACE LEVELS RAISED HIGHER AND HIGHER

by the narrowing of the cross-section, which is the common mode

for deepening the channel by inducing scour; that the raise of these surface-levels is in proportion to the contractment, and also according to the running feet of contractment, be it continuous or broken; also to show that rivers build up their bed-bottom in proportion as the surface level of the water is raised; also, that to prevent overflows there can be no end to the necessity of continually raising levees and banks higher and higher so long as the capacity of the stream is being encroached on by dykes and levees built to effect a deepening of the channel; further, that these raised levels of both the river surface and its bed-bottom extend throughout the river and all its confluents above the contractment. Now, what do we find was

THE STATE OF ALL RIVERS

before the human hand attempted to improve them? We find that every river had and has a velocity of current according to its incline, and an increased current can only be got by increasing the incline or difference between the water levels of the sections. This proposition is the main text of this address, and let us analyse it:—All rivers vary in width and depth, being generally shallow in their wide sections. For benefiting navigation, engineers have been in the habit of contracting the capacity of the river by banks or levees, in preference to dredging. By this narrowing, an increased velocity of current is got in the narrowed parts, which conditionally scours out the bottom; but this increased velocity is only got by impeding the current, which causes an elevation of the surface above the narrowed parts, and the amount of which elevation determines the velocity of current in narrowed parts.

Probably you will be astonished to hear that this increased head of water at the narrowed section

RAISES THE SURFACE LEVEL OF THE RIVER

and all its branches throughout the entire length of unbroken surface (up to cascades or falls), to the extent that the head is created, and that likewise the bed-bottoms of all the streams commence to immediately build up proportionately by

deposits that were formerly, in the river's natural state, carried through to the sea. But this elevation of level has also the tendency to cause a widening of the cross-sectional capacity of the river and its branches, and spread them out over the country, which fact again reduces the elevation in proportion to the spreading out; but, if local circumstances prevent a spreading out, then, whatever the artificial elevation at the narrowed part below will extend to the very inch up throughout the river and its confluents above the contractment. But if the river spreads out and increases its cross-sectional capacity, its velocity becomes reduced to less than what it was in its natural state, and consequently precipitation takes place immediately. The velocity becomes reduced simply because an increased capacity of cross-section permits a larger bulk to flow through at slower speed.

In this may be found the explanation why it always has been, and why it always will be, so long as the present method of improving rivers is adopted, that there is no end of the demands of the people on Governments for money and engineers to improve rivers. It is simply because

ONE SO-CALLED IMPROVEMENT

will invariably affect any number of deteriorations above it. Still another very important and entirely overlooked consequence follows in the wake of contracting the capacity of a river. Its tendency is to increase the winding and serpentine character of the river, and its channel above, by bends, elbows, and curves. The channel itself becomes scattered and non-continuous, being abruptly broken in places by shoals and bars. But, on the contrary, if one force of nature did not persist in trying to close up the mouth of the river and impede its flow into the sea, and no artificial contraction along its length existed, any and every river running through an alluvial soil would then become as straight as an arrow, without bend or crook of any sort. Its channel would become both deeper and continuous, as the current would become both concentrated and more rapid. It requires a greater force to run a crooked river than it does a

straight river, just the same as it requires more force to send a common ball

THREE MILES IN A CROOKED LINE

than it does three miles in a straight line. These conclusions may be readily perceived and proved on any river in the world where artificial contractions have taken place. As with light, gravitation, and motion, there is but one principle of hydraulics that operates in all rivers, so it is useless for certain people to advance the idea that there are certain phenomena and peculiarities found in some rivers and not in others. So my ideas may be illustrated and proved by any river in the world; but as our own Government is already spending many millions of dollars on works already commenced on the Mississippi, and as it is proposed to commence works that cannot be made to give the anticipated results assured by the managers thereof for hundreds of millions more, it is perhaps best, for the sake of public instruction, that I illustrate by the Mississippi—as whatever is done on that river, in changing the capacity of its cross-section affects not only that river itself, but also its confluents, the Red, Arkansas, Missouri, and Ohio, with their branches and feeders,

REPRESENTING PERHAPS 15,000 TO 20,000 MILES OF NAVIGABLE WATERS.*

The direct branches of the Mississippi are the Ohio, Illinois, St. Peter, Missouri, Arkansas, and the Red. The branches of the Ohio are the Allegheny, Monongahela, Tennessee, and Cumberland; of the Missouri, the Kansas, Platte, White, and Yellowstone; while those immense rivers, the Arkansas and Red, have innumerable branches also. Now I shall show you by the most practicable, positive, and irrefutable evidence, that the engineering and scientific talent of Europe and America will not overthrow, that whatever is done at the mouth of the Mississippi in the way of damming up and contracting the capacity of its outlet, and thereby impede

* Those interested in the St. John's, Hudson, Cape Frear River, &c., have only to substitute any of these names for the "Mississippi."

its outflow, under the specious idea of deepening its channel, first causes the surface-level of the river to raise, and then its bed-bottom also, throughout its entire length, inclusive of all its branches likewise; that the direct result of this increased raise of surface-level is the tendency or act of the river to spread out over the country and widen its cross-section where not confined, but that, confined or not, its surface-level is always raised, and it commences immediately

TO BUILD UP ITS BED-BOTTOM

above the contractments by deposits, and not scour it out; otherwise, whatever is done to contract the channel of the Lower Mississippi at its mouth, or anywhere above its mouth,

AFFECTS THE ENTIRE RIVER AND ITS BRANCHES ABOVE THE CONTRACTION;

and so with any stream, river, or current in the world.

These effects are, first, the uniform raising of the surface-level of the river and branches throughout their length equal to the original raise artificially created at the lower part of the river, whether this raise be from one contraction only, or an aggregate of several contractions at various parts, modified by the tendency of the river to spread out and increase its cross-section, with the consequence of a slower current thereat; secondly, the equal building up of the bed-bottom in accordance with the raise of surface-level, whether the raise be equal with the original raise, or whether it be modified by the spreading out; otherwise, the raise of bed-bottom will always equal or exceed the raise of water surface, be it what it may; thirdly, regarding the material deterioration of the navigable channels throughout the rivers compared with their former state, I shall mention

ANOTHER NOVEL AND VERY IMPORTANT POINT

not alluded to in works on river hydraulics, and one which may be the basis of a new school. It is that the incline of the surface of a river between the two ends of a narrow section is very much greater than that between the two ends of a wide section. By this means, which is its only means,

nature furnishes a rapid current between narrow banks and a slower current between wide banks. Observe* the varying inclines of the surface of a river running alternately between wide and narrow banks. Wherever and whatever the incline of surface, it indicates to a positive quantity the width of the bank.

During each of the last two sessions of Congress a bill concerning the "Leveeing of the Mississippi, and the reclamation of the lowlands," passed one of the two Houses, but failed in the other for want of time. About the same bill has just again been introduced in the Senate, "For the deepening of the channel of the Mississippi, and the protection of the alluvial lands." This bill simply means narrowing the river by artificial banks, dams, and jetties, in order, as is said, that a deep, navigable channel may be scoured out

FROM THE GULF TO CAIRO,

—that is the proposition that has been urged for years before Congress, before Boards of Trade, and before engineering societies all over the country, by a celebrated financier, assisted by "his sisters, and his cousins, and his aunts." The North-west and the West want to keep particularly instructed as to their future sufferings "*a la* Szegedin," if they allow their representatives to vote money for narrowing the river from the Gulf to Cairo, the minimum estimate of cost being $46,000,000 on a guess, but which twenty times that sum would not finish. This is a better way to put it than to suggest that if two miles of jetties at the mouth of the South Pass cost $5,000,000, how much would it cost to extend them 1200 miles up to St. Louis? This narrowing is intended by all the engineers and others who are favourable to the measure to increase the current so as to scour out the bottom of the river and deepen its channel, but the

MANAGERS HAVE SO FAR FAILED TO STATE DEFINITELY

how much increased velocity of current is necessary to accom-

* Note. Here the Lecture was explained by coloured diagrams, illustrating the entire text of the argument.

plish their purpose. As the river in its ordinary state runs from two and a half to three and a half miles per hour, let us assume that they propose to increase the velocity of it say only one-half mile per hour. They certainly would not expect to effect a scour with a less increase than that, and they may expect to find very little scour with even that little.

Now, it will probably surprise the Board of Managers of this great internal improvement work, as well as most of the inhabitants living in the heart of this country—living on the Red, Missouri, Ohio, etc.—that to get an increase of a half-mile per hour of the velocity of current, throughout the length of the Mississippi, from its mouth to Cairo, it will require a head of water at Cairo of ninety-four feet higher than at present: that is, the surface-level at Cairo

MUST BE RAISED THAT MUCH.

This estimate is based on the present velocity of the river's current and its natural incline of surface from Cairo down to the Gulf, which is given at 330 feet. When they get this head of water, which they propose to get and keep by levees, allow me to ask what is to be done with the waters of the Ohio, Red, Missouri, etc., and their branches? Will they be allowed to overflow the country, or will they be leveed also, and, if they were, would it do any good, and would all the banks and levees, though they be of mountainous proportions,

SAVE THE COUNTRY BECOMING THE BOTTOM OF AN INLAND SEA,

with occasional mountain-tops appearing to indicate the lay of Pike's Peak, Lookout, etc.? But these simple and childlike engineers and statesmen must be merely playing. It is simply impossible, with all the labour in the world to get an increased head of water of ninety-four feet at Cairo. Therefore, the current of the Mississippi cannot be increased half a mile per hour as proposed.

But, again, it need not be supposed that the river wants its channel uniformly deepened throughout its unbroken length in order to give an eight or ten-foot channel to St. Louis, because

it only needs to be narrowed where it is proposed to deepen it, say its wide sections only—say these represent a quarter of its entire length to Cairo, equal to an increased head at Cairo of twenty-three feet. Of course, levees would have to be built the whole distance to confine the increased level. Of course, it will be said, if you get this enormous raise of surface, there will be no need for the bottom to be scoured out. That is true, for, in fact, there would be no scouring of the bottom, except for a very few miles at the extreme lower end of the river. The increased depth would be got temporarily by merely raising the water surface, while from the very first the bed-bottom would be building up also, to follow the surface, as before said. In point of fact, the whole scheme of deepening the channel by narrowing it, raising its surface, and protecting the country from overflows by levees, is not worthy a sane man's thoughts, let alone one who pretends to be an engineer. It is unscientific, impracticable, and absurd, and while whatever good there is to it is but extremely temporary, its evil is

OVERWHELMINGLY AND PERMANENTLY DISASTROUS.*

Now, what has been done at the delta of the Mississippi by Captain Eads? He has

SIMPLY DAMMED UP AND CONTRACTED THE OUTLETS

of the river so as to get an increased head of water inside the delta of several feet. This increased rise on the short longitudinal length of the South Pass gives him a rapid rush of water through it, which effects a temporary scour, but, as already shown, this increased rise extends back throughout the length of the river and its branches to their very sources, unless stopped by cascades or falls, which of course the rise would not mount, but, of course, this backward extension of this full rise, as also

* If the assertion that the dynamic force of Niagara equals the force of the entire output of the world's coal mines be true, it is equally true and applicable to the Mississippi River, and if we can't utilize a part of this immense force to create and maintain navigable channels without attempting to further obstruct and lessen it, the sooner we give up abortive attempts at River and Harbour Improvements and stop wasting the nation's money the more creditable will it be for the entire nation.

shown, is modified by its spreading out over the country, or the increase of the cross-section of the river in width. All this operates

ADVERSELY TO THE DEPTH AND CONTINUITY OF THE CHANNELS

of the river and its branches, inasmuch as the original and natural cause of a river running through an alluvial soil, being crooked and deviating in its course, is the difficulty its waters have of escaping to the sea, on account of wave action outside continually attempting to close up its mouth by heaving sand and sediment into it. All this is, of course, made worse by artificial contractions using up the force of the outflowing water. I have always been a rank opponent of jetties from the first talk of their application to the Mississippi, and am more and more opposed to them each succeeding day—not because of their utter impracticability, which was the origin of my original opposition,

BUT BECAUSE EVIL CONSEQUENCES,

never dreamed of them, are continually looming up in their wake. When the Wizard of the North hatched a dozen chickens out of a dozen eggs in his hat, a buzz of admiration went up from his audience that was delightful to hear. It was immaterial to them how it was done; they saw the eggs, and in three minutes more saw the chickens; that was sufficient. The same buzz of admiration now goes up from certain parties through the country when it is proclaimed that there is no reformation of the bar outside the jetties. The country has not yet learned that there has been and is

LESS SEDIMENT CARRIED DOWN THE RIVER THE PAST TWO OR THREE YEARS

than any time since the days of De Soto: this is the inevitable result of damming up the river's outlets and raising the level of its waters and bed-bottom. The sediment that was formerly carried continually out to the Gulf is now being deposited throughout the river and its branches, and which, if the mouth of the river is ever properly opened, will be scoured

out again, but at a fearfully enhanced cost of engineering expense, labour, and difficulties that would seem for the moment to condemn the very success of the work as a failure. The millions of yards of sediment would seem to bury up everything but the river's channel and mouth. The present work at the mouth, with the rise of bed-bottom which is continually building up by deposits,

CAUSES A TOTAL STOPPAGE OF SCOUR

throughout the river above, and will until the equilibrium of the water rise is re-established, while the system of opening the mouth by a "false bar" will

CAUSE AN EFFECTIVE SCOUR THROUGHOUT THE CHANNEL

of the river and its branches, the channel current being decidedly concentrated thereby. But that there is no reformation of the bar outside the jetties may be safely denied by any one. If there was not a pound of sediment that went down the river, the wave action of the Gulf would heave up the sand from the bottom of the sea into the mouth of the river. Again, it requires somewhat of an elastic conscience for any man to say that there is a littoral current outside the mouth. But if there was a littoral current of even ten knots per hour sweeping across its mouth, the bar would still be there; the velocity of the littoral current merely determining the position of the bar on the river's line of prolongation. The engineering talent of the world has been universally engaged in attempting to show that each and every

RIVER SHOULD OR COULD BE MADE TO EXIST WITHOUT A BAR

at its mouth. This is just as impossible as that a man could exist without a stomach. Consequently, all engineers have failed in their attempts to open the mouth of a river, except for the moment, because no river can exist without a bar at its mouth, to use up the force of the sea waves. Therefore the

SCIENTIFIC WAY OF OPENING THE MOUTH

of a river, both for the benefit of its commercial entrance and the benefit of its

CHANNEL THROUGHOUT ITS ENTIRE LENGTH,

is simply to build a false or artificial bar directly across its mouth, but far out in deep water, and so deeply submerged that all vessels may pass freely over it in going out and coming in. The result of this is to enable the outflowing river current to cut down the old natural bar and increase the channel both in depth and width. That is all there is to the question of giving the Mississippi River the

DEEPEST AND WIDEST COMMERCIAL ENTRANCE OF ANY PORT IN THE WORLD,

even up to forty feet draught if it was required, followed by the important consequence of deepening the channels of the river and its branches several feet, besides straightening them as well as the river, and enabling it to get away with its floods, all of which some Congress in the future will be able to see the utility of.

I here quote from a previous lecture :—

"Two contrary forces always exist at the mouth of a river discharging into the sea, viz., one to cut out and the other to close up. Remove either of these forces, and the other must necessarily have unimpeded action, either to close the river completely, or to entirely remove the bar, according to which force is removed, the size or depth of the bar being actually only an indication or measure between the two opposing forces.

"These two forces are ever present in all rivers debouching into the sea, and when we succeed in effecting the one important to our purpose, that instant the bar impediment becomes one of insignificance, after having been for ages a standing barrier to navigation, as well as science. If the closing-up force is removed, the cutting-out force will quickly prove itself by eroding and cutting out over the bar a full-sized cross-section of the river, not in capacity alone, but what is most desired and vital, a cross-section that in shape, that is, breadth compared with depth, will closely approximate to the same measurements of the cross section of the river above its bar, and where no impediment exists by reason of shoaling, &c.; otherwise the river will carry quite its uniform shape into deep water outside its mouth; or remove the other force, and the mouth of the river will immediately close up, forming a continuous and even beach across the mouth, unbroken by a depression. This is plain and positive, and must be accepted without question.

"Now there is one of these forces beyond the control of man; that force he is entirely unable to remove, though he may change its direction, which would avail nothing against the difficulty sought to be obviated. This force is that which pertains to the outward flow of the river, and is due to the

training of the upper country, and must have an outlet. The other force is entirely within the control of man, and my purpose is to show the nature and origin of that force, as well also to show how it may be reduced or destroyed in such a practical and simple manner that it must seem evident that no great trouble can hereafter be had in obtaining a proper and satisfactory depth through the bar of any delta river, as well as deepening the bars of new delta-forming rivers and harbours, by means other than narrowing the channel, constructing *training & closing*, dredging, or, worst of of all, canalling.

"This latter force is the force of wave action, therefore wave action being the cause of bar formation, and the upheaval of sand, &c., in the mouth of a river, it is only necessary to check the undulations of the sea to obviate it, and this I propose to effect by what in higher science would be called 'interference,' and will be accomplished by building a 'false bar' far out in deep water, but having its apex submerged 30 to 40 feet for accommodating the passage of vessels over it, as also to prevent any impediment to the outflowing current, but which on the contrary it facilitates and increases."

It would be very satisfactory for you to see many hydrographic charts of the conditions at various times of the South Pass jetty-channel, issued under act of Congress, calling for constant reports from the Government superintending engineers. While most of the reports from time to time have said that "only 3500 or 2800, or 5500, etc., cubic yards of sediment were to be removed from the sea and to give a sixteen, twenty, or a twenty-four foot channel from the head of the Pass through to the Gulf," still that little lump of sand will keep its position in spite of dredging or rapid currents got by jetties. It is simply the little "carbuncle" that knocks the jetty theory into "a cocked hat."

One word more:—The jetties at the Maas mouth of the Rhine, and the Sulina mouth of the Danube have been repeatedly given by engineers as eminently successful, and as proving the correctness of the jetty business. For my part, I ask any one

TO SHOW GREATER ENGINEERING FAILURES

than these two very works. Notwithstanding its constant outlay, the Dutch Government is unable to keep more than sixteen feet at high tide on the Maas bar, so that the heavy draft vessels bound to Rotterdam can only reach that town by way of a branch of the river left in its natural state,—*i.e.*, unimproved by jetties.

Besides, the Maas through its entire length has filled up several feet with mud, and the Government has had fifteen to twenty dredge boats at work for two years past to dredge it down to its old level. But it is a job they will give up after a while, and the Maas will be turned into swamp meadow or its contractments be removed. The Danube discharges into a quiet, shallow little sea, quite land locked, and therefore has totally different conditions from what are found on our Atlantic or Gulf coast. But even with these favourable conditions, what has it cost to keep fifteen to seventeen feet of water on its bar? Millions of money and constant labour. Is that all? Well, no, it has also cost that part of Europe hundreds of millions by its raising the bed-bottom of the river, costing enormously for raising the levees and banks to keep the water confined, and the bursting of which, this season alone, in South Hungary, on the most careful computation from various authorities, amounts to a loss approximating $25,000,000, and a hundred human lives.

I would like to know from that great institution in Great George Street, Westminster, whose members manipulated the jetties of the Danube, as also the jetties of the South Pass of the Mississippi, where does the success of the Danube* works show itself? In the seventeen feet on its bar? Not much! Now, another point: The artificial rise of four to six feet created in the Mississippi delta has just stopped the former drainage of the entire valley to that extent. If the raise is still made higher, of course the stoppage will be still greater. But these few feet represent the submergence of an enormous extent of country in any country drained by a big river. Has this abnormal condition of the drainage of the Mississippi the past two years had anything to do with

ITS ABNORMAL SANITARY CONDITION

* European engineering journals say there are only 38 inches of water in the Danube channel, just above Vienna, at extreme low water, because of the formation of sand bars. Will anybody pretend to say that such shallow depth, so near the mouth of one of the great rivers of the world, ever existed while the river was in its natural state, and unimproved by art?

the past summer? Many constituents in that part of the country would like to know.

If it has, then the malarious and sporadic condition of the valley is likely to reappear each successive season and so continue as long as the so-called improvements exist. This condition will probably express itself by yellow fever on the Lower, and typhoid on the Upper Mississippi and its branches. It is said the epidemic in the valley last year cost the country 15,000 lives, and $100,000,000 in money; if so, the question is really worthy of being considered on its merits and uninfluenced by party clique or political views.

Now, as a wind-up, I will say, the bigger the river the bigger the failure always of jetties, or any contractment of the river's natural capacity, simply because the damages that follow are proportionate to the size of the river, and may be measured by its number of running feet or miles—for instance, for every acre reclaimed from the natural capacity of the Lower Mississippi, will be followed by 10,000 acres becoming swamped on the Upper Mississippi and its branches. Where the good comes in, I have never been able to learn from the multitudinous volumes published on the subject. Captain Eads had three-quarters of the burden of his original contract taken off by the last Congress, by its relieving him of the necessity of getting 350 feet width on the 30 feet depth of channel of the South Pass, and accepting instead a geometrical line of no width.

Undeniably, the only proper method to avoid overflows, levees, and poor channels is the "outlet" system; but this system, though repeatedly tried, has never been tried but in one way, viz., by cutting new and additional outlets and by dredging out and enlarging old outlets; but the success attending this particular application of the system has never been more than temporary, for the reason that the aggregate capacity of a river's outlet cannot be increased or

ESTABLISHED BY ANY SUCH WORKS,

the quantity of outflowing river water alone establishes that

capacity, not even tidal currents assisting; but though this style of application of the "outlet" system has been obsolete for many years, yet for its extreme inexpensiveness, ready application, and immediate, though but temporary, relief, it is by all odds a superior method, as also an effective adjunct to levees, and will achieve the same results for but a tithe of the cost.

In conclusion, if the General Government had charge of the levees, the raising of the water surface might be interesting generally, but as each State raises a tax for keeping floods out of its borders, it is more a question of local interest at present.